

AMENDMENT TO THE CLAIMS

1. (Currently Amended) A cache-coherent input/output device comprising:
a plurality of client ports, each to be coupled to one of a plurality of port components;
a plurality of sub-unit caches, each coupled to one of said plurality of client ports and
assigned to one of said plurality of port components; and
a coherency engine coupled to said plurality of sub-unit ~~eaches;~~ caches.
~~wherein the plurality of client ports, the plurality of sub-unit caches and the coherency
engine are integrated onto a single cache-coherent device.~~
2. (Original) The device of claim 1 wherein said plurality of port components include
processor port components.
3. (Original) The device of claim 1 wherein said plurality of port components include
input/output components.
4. (Original) The device of claim 3 wherein said plurality of sub-unit caches include
transaction buffers using a coherency logic protocol.
5. (Original) The device of claim 4 wherein said coherency logic protocol includes a
Modified-Exclusive-Shared-Invalid (MESI) cache coherency protocol.

6. (Currently Amended) A processing system comprising:
- a processor;
 - a plurality of port components; and
 - ~~an integrated~~ a cache-coherent input/output device coupled to said processor and
- including a plurality of client ports, each coupled to one of said plurality of port components, said cache-coherent device further including a plurality of caches, each coupled to one of said plurality of client ports and assigned to one of said plurality of port components, and a coherency engine coupled to said plurality of caches.
7. (Original) The processing system of claim 6 wherein said plurality of port components include processor port components.
8. (Original) The processing system of claim 6 wherein said plurality of port components include input/output components.
9. (Currently Amended) In a cache-coherent input/output device including a coherency engine and a plurality of client ports, a method for processing a transaction, comprising:
- receiving a transaction request at one of a plurality of client ports on ~~an integrated~~ the input/output cache-coherent device ~~with a coherency engine~~, said transaction request includes an address; and
 - determining whether said address is present in one of a plurality of sub-unit caches, each of said sub-unit caches assigned to said one of a said plurality of client ports.

10. (Original) The method of claim 9 wherein said transaction request is a read transaction request.
11. (Original) The method of claim 10 further comprising:
transmitting data for said read transaction request from said one of said plurality of sub-unit caches to one of said plurality of client ports.
12. (Original) The method of claim 11 further comprising:
prefetching one or more cache lines ahead of said read transaction request; and
updating the coherency state information in said plurality of sub-unit caches.
13. (Original) The method of claim 12 wherein the coherency state information includes a Modified-Exclusive-Shared-Invalid (MESI) cache coherency protocol.
14. (Original) The method of claim 9 wherein said transaction request is a write transaction request.
15. (Original) The method of claim 14 further comprising:
modifying coherency state information for a cache line in said one of said plurality of sub-unit caches;
updating coherency state information in others of said plurality of sub-unit caches by said coherency engine; and

transmitting data for said write transaction request from said one of said plurality of sub-unit caches to memory.

16. (Original) The method of claim 15 further comprising:

modifying coherency state information of said write transaction request in the order received; and

pipelining multiple write requests.

17. (Original) The method of claim 16 wherein the coherency state information includes a Modified-Exclusive-Shared-Invalid (MESI) cache coherency protocol.